

INTRAOCULAR LENS AND METHOD FOR MAKING SAME

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to intraocular lenses including a ring or rim of colored material, and more particularly, pertains to the reduction of glare resulting from the edge effect and from the light transmitted from the positioning loops to the lens itself.

2. Description of the Prior Art

None of the prior art lenses known to applicant have utilized structure for reduction of glare resulting from the edge effect and from the light transmitted through the positioning loops to the lens itself.

The edges of a lens are known to cause glare as a result of the light which is incident on the lens but which is not brought to a focus on the retina. Because the loops are generally made from the same material as the central portion, the light falling on the loops is transmitted to the lens itself, causing glare and reflections which are distracting and uncomfortable.

The present invention overcomes the disadvantages by providing a darker region which reduces the intensity of the light transmitted from the edge of the lens and from positioning loops to the central region.

SUMMARY OF THE INVENTION

The general purpose of the present invention is to provide an intraocular lens or intracorneal lens with a ring or rim of colored material which minimizes glare, and distracting reflections caused by the edge effect and from the light transmitted from the positioning loops to the lens itself.

One preferred embodiment of the present invention is a lens which has a ring or rim peripheral portion which is a darker color, serving to reduce the intensity of the light transmitted through the loops to the central portion of the lens. The lens can be an anterior chamber lens or posterior chamber lens with loop or an intracorneal lens.

One preferred method of fabrication is to coat a clear rod of PMMA with a darker outer layer through an extrusion process. Alternative methods of manufacture include the introduction of a dye into the outer layers of the clear PMMA rod.

Having thus described several embodiments of the present invention, it is the principal object hereof to provide an intraocular or intracorneal lens which is substantially devoid of glare and reflections caused by light transmitted to the lens through the positioning loops, holes, or edges of the lens.

One object of the present invention is to provide a method for fabrication of an intraocular lens which possesses improved quality of vision because of the reduced glare and reflections normally introduced by the positioning loops or edges of the lens.

Another object of the present invention is to provide cylindrical boule member with a colored ring or rim, which lens can be lathe cut.

A further object of the present invention are positioning holes and radial loop holes in the colored ring minimizing glare from the holes.

An additional object of the present invention is a single-piece positive lens with colored haptics.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a top view of an intraocular lens showing the dark peripheral portion according to the present invention;

FIG. 2 illustrates a sectional view along the line 2—2 of the lens shown in FIG. 1;

FIG. 3 is a cross sectional view of a rod of transparent material ringed dark material;

FIGS. 4a, 4b, and 4c show the material used to fabricate the lens in various stages of manufacture;

FIGS. 5a, 5b, and 5c show the material used to fabricate the lens at various stages of an alternate method of manufacture; and,

FIG. 6 illustrates an enlarged view of the portion of FIG. 5b enclosed in dotted line.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates an intraocular lens 10 including a lens optic 12 and two positioning loops 14 and 16. The lens optic 12 includes a clear central portion 20 and a colored peripheral portion 12. The entire assembly is made of any suitable material, preferably PMMA or alternative materials such as polysulfone.

The colored ring or rim portion 22 is sufficiently darker in color to substantially reduce the intensity of light transmitted from the outer edge to the clear central portion 20. While the transmissivity of the portion 22 is preferably reduced by coloring with a darker color than the transparent section, such as blue, the transmissivity can be reduced by other processes as well. The width of the colored portion 22 is selected to provide adequate space for the attachment of the loops 14 and 16 by processes such as staking, adhesive bonding, or ultrasonic bonding. The width of the colored portion 22 is also sufficient to provide adequate reduction in the intensity of the light transmitted from the periphery 12 to the central portion 20 of the lens 10. The loops 14 and 16 shown are made of colored material. This further reduces the intensity of the light transmitted to the clear central portion 20. Alternatively, the loops can be made of clear material similar to that used in the central portion 20. The same discussion applies to intracorneal lens and the edge effect of course. The diameter of the clear and colored portions are predetermined based on the specific design of the lens. Positioning holes or locating holes 18a-18n are provided in the colored area, as are radial loop holes 15 and 17 for securing loops to the lens optic 12.

FIG. 2 shows a sectional view of the lens of FIG. 1 along the line 2—2. The colored portion 12 extends annularly from the rear surface 24 to the front surface 26.

FIG. 3 shows a cross section of a rod. The lens and loops can be lathed from a single rod of material as illustrated FIG. 3 where the darker outer ring is blue and the center portion clear. The lens loops as such could be lathe cut as illustrated in dashed lines.

FIGS. 4a, 4b, and 4c illustrate various stages in the fabrication of the rod from which lenses are cut by conventional means. The initial rod or boule 30 of clear PMMA is substantially larger in diameter than the finished lens, and can be as long as is convenient to handle. The boule 30 is then coated with a uniform layer 32 of colored PMMA as shown in FIG. 4b.

The colored layer 32 can be applied to the boule 30 by passing the boule 30 through an extrusion dye having